

The influence of the Whitehead torpedo, of which we have heard so much of late, will likewise be felt for the first time during the present war. An implement so ingenious in its character that, as Lord Charles Beresford the other day happily remarked, it can do almost anything but talk, is in the possession of both belligerents, and will doubtless be heard of ere long on the Danube and in the Black Sea. These torpedoes are manufactured at Fiume on the Mediterranean, and, like Krupp guns, are to be purchased by any one who chooses to pay for them.

The British Government manufactures its own Whitehead torpedoes in this country, having paid several thousands of pounds for the privilege. The machinery inside this torpedo is still a secret, which is strictly maintained by our Government, but the principle of the invention is well known. It is a long cigar-shaped machine measuring a dozen feet and upwards. In the head is a charge of some violent explosive, such as gun-cotton, or dynamite, which explodes as soon as the torpedo strikes an obstacle. The motive power is compressed air, which is forced into the machine by powerful air-pumps, immediately before the torpedo is discharged into the sea, no less than 600 lbs. on the square inch being the pressure exerted. The Whitehead is shot from a tube, and moves through the water as straight as a dart, the compressed air working upon a screw in the tail of the machine. The delicate machinery permits the torpedo to swim at any depth below the surface that may be desirable, and it flies straight in the direction it is aimed, at a speed of something like twenty miles an hour. If it fails to strike the foe, then the intelligent apparatus at once rises to the surface, becoming innocuous as it does so, and may in this condition be captured without difficulty.

A torpedo of this sort striking the sides of an ironclad would almost infallibly send her to the bottom, and although it has been proved that a network or crinoline around the ship is capable of retarding the progress of a "fish" of this nature, and exploding the same harmlessly in its toils, it is obviously a very difficult matter thus to protect one's craft. Against heavy torpedoes, indeed, there seems no way of defence at all (the Whitehead generally carries a charge of 70 lb. or 80 lb., but moored torpedoes may contain a 500 lb. charge), and therefore Turkish vessels will have to give Russian ports a wide berth. All must remember how the magnificent fleet of the French was kept at bay by the torpedoes of the Germans in the North Sea in 1870, and the Black Sea ports are no doubt similarly protected. So demoralising is the dread of the torpedo with sailors apparently, that they will dare anything rather than venture into waters which conceal these cruel foes.

H. BADEN PRITCHARD

THE OWENS COLLEGE UNIVERSITY QUESTION

IN his address on Tuesday last week, at the London University, the Chancellor noticed in dignified and sensible words the proposed application of Owens College to the Government for a Charter of Incorporation as a university, either by itself, or as the centre of a family of northern colleges. Nothing could well have

been more unfortunate or ill-judged than the furious onslaught of Mr. Lowe, the member for the University, in the *Fortnightly Review*. The complaint of the Manchester people is that the London system, however suitable in itself, hampers the educational activity and usefulness of institutions capable of an independent existence, and it was scarcely decent for the member for that university to step forward in her interests as a mere partisan of the *status quo*. In fact there is no antagonism. Manchester has never denied that it is a good thing that there should be a university in London to examine all comers. She has said that she thinks it a bad thing for institutions with a sufficient permanent teaching staff, a large enough number of students and a solid establishment in the district to which they belong, to have to shape their work according to the ideas of any central university that must suit all comers. Mr. Lowe is the one member of Parliament who should have held his tongue on the matter till he was forced to speak, because a hasty utterance on his part could not but seem to compromise his University. Lord Granville took pains to remove the injurious impression of an unworthy jealousy in London which Mr. Lowe's article could scarcely fail to create. He tells us that London feels "absolutely no objections of a merely jealous character," and that London would have a "very friendly feeling to any university which, after due deliberation and with a sound regard to the real advantages of education, may hereafter be established." In that wise and sensible attitude it is open to the University to consider either of the two schemes suggested for the northern university. The first of them, which is that favoured by the college authorities, is that Manchester should be created a university much as Glasgow is. According to the views of the supporters of that scheme we should be prepared to multiply our universities as the Scotch have done, by chartering one in any large town where its students and its endowments, its history and its reputation offer equally solid guarantees of permanence. The other is that Manchester should be the capital—*primus inter pares*—of a new northern university on the original affiliation basis from which London has departed. The weakness of the affiliation principle is that it is scarcely in nature that it should not gradually relax, so that colleges should be affiliated on easier and easier conditions till it becomes useless to keep up the farce. But both schemes, the latter of which, indeed, is Dr. Carpenter's, are practicable—both worthy of careful consideration and discussion—and it is pleasant to see that the University of London, through her Chancellor, disavows any settled policy of obstruction.

Lord Granville reminded his hearers of what most people have forgotten—the history of the incorporation of the University. It was a subject of excited debate in this country and in Parliament, for ten years from its first inception. The project was started in 1825. Funds were then raised by subscriptions in 100*l.* shares, and the institution was in activity in 1828. In 1830 an application was made to the Crown for a charter, and the charter as prayed for had gone through nearly all the necessary preliminary stages, when its progress was stayed by the opposition of Oxford and Cambridge. In 1833 the application was renewed, and it was supported by an address to the throne from the City of London. It was opposed

by Oxford and Cambridge, by the Royal College of Surgeons, by the teachers of medicine and surgery in the London hospitals, and by others. The matter was referred to the Privy Council, and argued before it in 1834. There was no question then of anything so futile as what has been once or twice suggested for Owens College, the title of university, without the privilege of degrees. The Privy Council found the subject surrounded by difficulties, and adjourned its consideration. Shortly after, Lord Melbourne's Ministry, which was friendly, retired from office, and Sir Robert Peel's, which took the view of the old universities, succeeded. An address to the Crown, however, was carried against the Ministry by 246 to 136, on the motion of Mr. W. Tooke, praying that a charter might be granted to the University of London, with no restriction but that they were not to confer degrees in divinity. The Privy Council was asked to report on the subject, but the report was delayed, and before they presented it Lord Melbourne returned to power. In August, 1835, the Chancellor of the Exchequer, Mr. Spring Rice, communicated to the Council of the existing University College that Government proposed to incorporate by charter as a university in London, a body of gentlemen eminent in learning and science, with the power of examining and granting degrees in arts, medicine, and laws to students of *certain colleges in London, therein named*, and of others existing throughout the country to be afterwards recognised, as well as of the schools of professional education. This university was to be supported by an annual grant. There were to be no religious tests. The existing body, which called itself the University of London, received a charter as a college and was named as one of the colleges entitled to submit students for examination. The two charters to the new university and the new college were issued on November 28, 1835. They have been several times modified. The list of affiliated colleges was always large, and as the Senate of the University had no control over the affiliated colleges it grew unwieldy, institutions of the feeblest character receiving affiliation. In 1863 a charter was granted empowering the Senate to admit persons not educated in affiliated colleges to examination, and this decision creates the University of London of to-day as distinguished from the institution of the same name founded in 1835. About half the students now come from affiliated Colleges and half from anywhere or nowhere. The examinations must be fixed in view of this fact. Examiners must take into account as a most vital matter the books on the subjects of their examination which are readily accessible to students, and they cannot shape their examinations in view of the practice in teaching of any one or more of the affiliated colleges. We hope that the proposed university of the north may have a shorter novitiate, and that she may be conducted in as elevated a spirit and with as resolute a desire to promote the interests of literature and science as the University of London has been. It would have been a painful spectacle if the youngest of our Universities, forgetful of her own early struggles, had spent her energies in an opposition which Oxford and Cambridge have thought unnecessary or unworthy of them. The speech of her Chancellor leads us to hope that the claims of the proposed new university will be considered calmly and on their merits.

NICHOLSON'S "LIFE-HISTORY OF THE EARTH"

The Ancient Life-History of the Earth; a Comprehensive Outline of the Principles and Leading Facts of Palæontological Science. By H. Alleyne Nicholson, M.D., D.Sc., M.A., Ph.D. (Gött.), F.R.S.E., F.L.S., Professor of Natural History in the University of St. Andrews. (Edinburgh and London: William Blackwood and Sons, 1877.)

THERE is no feature in which the ordinary geological manuals in common use in this country are more deficient than in the sketches which they give of the leading characteristics of the animal and vegetable life of the successive periods which they describe. The truth of this remark will be made strikingly apparent by a comparison of the works in question with some of the best German treatises on geology, such as those of von Hauer and Credner, and still more if we examine them side by side with that most excellent of text-books, Prof. Dana's "Manual of Geology."

Some writers on geology in this country would indeed appear to hold the opinion that, since the succession of geological formations was first determined in our own islands, an appeal to the facts of British stratigraphical geology must in every case be final in deciding all difficulties which may arise concerning the definition and limits of the different systems of stratified rocks in every part of the globe. Hence the controversies which have taken place in this country concerning the boundaries between the Cambrian and Silurian, the Devonian and Carboniferous, and the Permian and Trias have acquired an altogether factitious importance, and undue weight has been attached to the interpretation of some obscure section, the significance of a local unconformity, or the appearance—often a fallacious one—of a gradual transition between two sets of beds, while far more suggestive facts connected with the relations of the fossil contents of the two series of rocks are too often altogether lost sight of.

But it cannot be too strongly impressed upon the minds of English geologists that the district in which a system of strata is first detected may not necessarily be the one in which it is best adapted to serve as the type of that series; that as a matter of fact the best illustration of the features and relations of the Cambrian and Silurian is to be found, not in Wales, but in Bohemia; and of the Devonian, not in Devonshire, but in the Eifel. English students, too, need to be reminded that the classification of the stratified rocks is based not upon the occurrence of certain physical breaks, in the continuity of a series of beds, which are often, indeed, of very local character and small importance, but upon the great principle that each formation is characterised by a well-marked and distinctive fauna or flora. Concerning the fact, position, and significance of many of the physical breaks in the succession of formations, the ablest field-geologists, such as Sedgwick and Murchison, Jukes and Godwin-Austen, have frequently arrived at very opposite conclusions; and the importance which has been attached to these discussions on points of details has doubtless led many to entertain a notion of the instability of the foundations of the geological systems of classification which is very far from